

## **REMARKS**

Claims 1-2, 4-7, 9-12, and 15 are pending in the present Application. Claims 4 and 9 are cancelled, leaving claims 1-2, 5-7, 10-12, and 15 for consideration upon entry of the present Amendment.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

### **Claim Amendments**

Claim 1 is amended to incorporate the limitations of cancelled claim 4 and to specify that the "system" is a "computer system", which is supported by the specification as filed at p. 12, line 28-p. 13, line 2. Further, Applicants note that to the ordinary artisan a "computer system" is defined as a computer (i.e., a machine) and any required software and peripheral devices that are necessary to make the computer function, as evidenced by the definition of a "Computer System" on the attached printout downloaded from the internet on October 26, 2009 from [http://www.webopedia.com/TERM/C/computer\\_system.html](http://www.webopedia.com/TERM/C/computer_system.html). Computers and computer peripheral devices are well-known to the ordinary artisan.

Claims 2, 5-6, and 15 are amended to be consistent with amended claim 1.

Claims 7 and 12 are amended to incorporate the limitations of cancelled claim 9. Claim 7 is further amended to recite that the method is executed on a specifically programmed computer. Support for this amendment is found in the specification as filed at p. 12, line 28-p. 13, line 2.

### **Claim Rejections Under 35 U.S.C. § 101**

Claims 1-2, 4-7, 9-12, and 15 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. Applicants respectfully traverse this rejection.

In its recently issued *en banc* majority opinion in *In re Bilski*, the Federal Circuit articulated a "machine-or-transformation" test for patent-eligible subject matter under § 101 of the Patent Act. *In re Bilski*, \_\_\_ F.3d \_\_\_ (Fed. Cir. 2008)(*en banc*) "A claimed process is surely patent-eligible subject matter under § 101 if: (1) it is tied to a particular machine or apparatus, *or* (2) it transforms a particular article into a different state or thing." Slip op. at 10. Certain considerations are applicable to analysis under either prong of the test. "First, [ ] the use of a specific

machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility. See *Benson*, 409 U.S. at 71-72. Second, the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity. See *Flook*, 437 U.S. at 590.” Slip. op. at 24.

With respect to claims 1-2, 4-6, 12, and 15, the Office Action (8/14/09, p. 4 last paragraph) alleges that the system may not be a particular machine or apparatus, that the various “units” are not clearly disclosed and claimed as tangible hardware components of the system and may be completely software driven.

Claim 1 is amended to clarify that the system of claim 1 is indeed a device, i.e., a computer system comprising a storage unit, an information search unit, and a location estimation unit. As noted above a “computer system” is defined as “A complete, working computer. The computer system includes not only the computer, but also any software and peripheral devices that are necessary to make the computer function.” Applicants assert that the computer system of claim 1 is therefore a specific machine (i.e., a computer) that has peripheral devices (e.g., the storage unit) and/or specifically programmed software units (e.g., the location estimation unit). Therefore independent claim 1 and dependent claims 2, 5-6, and 15 all meet the machine test of *In re Bilski*.

Claim 7 is amended to clarify that the method is executed by a specifically programmed computer. Applicants believe that as amended the method of independent claim 7 and dependent claims 10-11 meet the standard of *In re Bilski* of being tied to a specific machine.

Claim 12 is directed to a computer readable medium having embodied thereon a computer program comprising computer readable code for executing the method of claim 7, wherein the computer readable medium is not a carrier wave. (see claim 12, line 20) As the method is statutory, Claim 12 a physical computer readable medium is therefore also directed to statutory subject matter.

Applicants request reconsideration and withdrawal of the rejection of claims 1-2, 5-7, 10-12, and 15 under §101 as directed to nonstatutory subject matter.

#### **Claim Rejections Under 35 U.S.C. § 103(a)**

Claims 1-2, 4-7, 9-12, and 15 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over *Benson et al.* (*Nucleic Acids Research*, 1999, Vol. 27, pp. 38-43; Vol. 30, pp.

17-20) (previously cited; hereinafter “Benson”) in view of Wheeler et al. (*Nucleic Acids Research*, 2002, Vol. 30, pp. 13-16) (hereinafter “Wheeler”). Applicants respectfully traverse this rejection.

“A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

The claimed invention is drawn to a computer system and method for determining a location of a target sequence in a genome sequence, and to a computer readable medium having embodied thereon a computer program comprising computer readable code for executing the method.

Claim 1 is drawn to a computer system for determining a location of a target sequence in a genome sequence, comprising: a storage unit for storing a crosslink map, wherein the crosslink map comprises records of sequence information for a plurality of versions of a genome sequence; an information search unit, for searching for identifier information and sequence information corresponding to a target sequence among the records in the crosslink map; and a location estimation unit, for determining a reference group comprising reference sequence information for an organism, wherein the reference sequence information is represented in the crosslink map by more than a predetermined number of records; calculating a difference value of a start position and an end position of the reference sequence information obtained from the crosslink map; determining a location of the target sequence in the genome sequence by a location shift corresponding to the difference value by assigning a priority order to the difference value for the reference sequence information based on number of records for the reference sequence information in the crosslink map.

Independent claims 7 and 12 have been amended to include language that determining a location of the target sequence in the genome sequence by a location shift corresponding to the difference value by assigning a priority order to the difference value for the reference sequence information based on number of records for the reference sequence information in the crosslink map, parallel to the language of claim 1.

Applicants respectfully submit that neither the Benson reference nor the Wheeler reference, whether alone or in any combination, teach calculating a difference value of a start position and an end position of the reference sequence information obtained from the crosslink map; and determining a location of the target sequence in the genome sequence by a location shift corresponding to the difference value as currently recited in independent claims 1, 7 and 12.

Further, the Benson reference and the Wheeler reference do not teach that the location estimation unit determines a location of the target sequence in the genome sequence by assigning a priority order to the difference value for the reference sequence information based on number of records for the reference sequence information in the crosslink map.

While Wheeler teaches a new alignment format for BLAST called a “Hit Table” (p. 12, col. 1, 1<sup>st</sup> full para.) with each database hit, positions of alignment starts and stops, scores and Expectation Values (defined as a measure of statistical significance of the alignment; p.14, col. 1, lines 1-3), Wheeler does not teach determining a location of a target sequence in the genome sequence by assigning a priority order to the difference value for the reference sequence information based on number of records for the reference sequence information in the crosslink map. Benson does not make up or this deficiency.

Applicants submit that as all elements of independent claims 1, 7, and 12 are not taught by the combination of references, taken alone or in combination, independent claims 1, 7, and 12 cannot be obvious over Benson in view of Wheeler. The remaining rejected claims depend from these independent claims, and therefore also cannot be obvious over the cited combination of references.

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-2, 5-8, 10-12, and 15 as obvious over Benson in view of Wheeler.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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